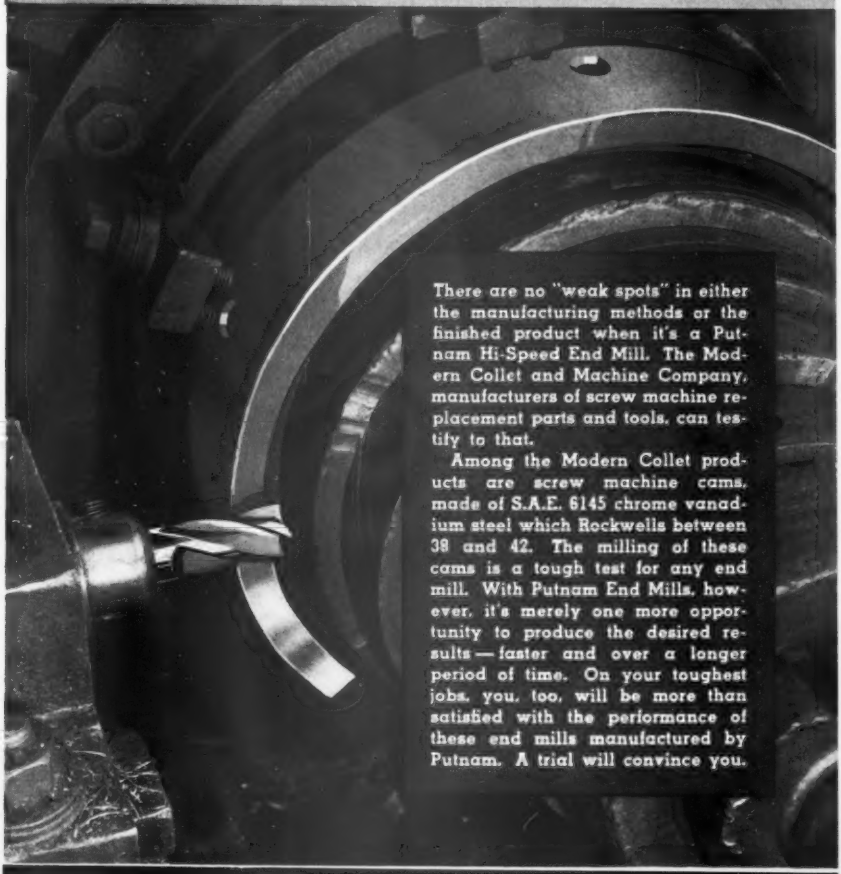
TOOL DIE MACHINE
PROGRESS
THE NATIONAL TOOL AND DIE JOURNAL

TOOLS, DIES, JIGS, FIXTURES, MOULDS, GAGES, MACHINES
Design and Engineering
PRECISION SPECIALTIES
STAMPING and PARTS PRODUCTION
Official Publication
Special Tool, Die & Machine Shop Industry

SEPTEMBER
1939

Circulation more than 12,000

Where Jobs Are TOUGH, You'll Find PUTNAM END MILLS In Use



There are no "weak spots" in either the manufacturing methods or the finished product when it's a Putnam Hi-Speed End Mill. The Modern Collet and Machine Company, manufacturers of screw machine replacement parts and tools, can testify to that.

Among the Modern Collet products are screw machine cams, made of S.A.E. 6145 chrome vanadium steel which Rockwells between 38 and 42. The milling of these cams is a tough test for any end mill. With Putnam End Mills, however, it's merely one more opportunity to produce the desired results — faster and over a longer period of time. On your toughest jobs, you, too, will be more than satisfied with the performance of these end mills manufactured by Putnam. A trial will convince you.

PUTNAM TOOL COMPANY
2985 Charlevoix Avenue • Detroit, Michigan

Can Your Shop Do "Extra" Jobs?

SPECIFICATIONS:

Height .....Approx. 58 inches
Floor Space .....Approx. 29" x 33"
Weight .....Approx. 600 lbs.
Motor: 1 HP—1750 RPM—220 or 440 V.
Grinding Wheels: 8" dia. 3½" face.

The companion Work Bench, also portable, makes the Grindrite particularly convenient for rapid handling of small dies and die parts. Together the Work Bench and the Grindrite are a definite factor in lowering die costs.

OUR DIE SERVICE

Our die designing and building facilities are serving many important die users. Our experience is at your command. We have our own pattern shop and tryout presses.

Is your shop set up to take extra jobs—those that frequently are tough ones or ones that are in a hurry? You can eliminate the grinding and finishing "bottle-neck", so often encountered, by using the Grindrite, the heavy duty precision grinder. We developed the Grindrite in our die shop for fast stock removal and to reach surfaces ordinarily difficult to work on.

The Grindrite is powerful, rugged and since it is portable it can be taken about the shop quickly and easily. The Grindrite is saving up to 50 percent of previous grinding cost for many leading shops.

Write for catalog and list of users.

Send us your blueprints

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TO LEARN PRICE OF CYLINDER SPECIFY FOLLOWING:
1. Cylinder diameter or force required.
2. Length of stroke. 3. How cylinder is to be mounted.

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TOOL DIE MACHINE PROGRESS
THE NATIONAL TOOL AND DIE JOURNAL

TOOL-DIE-MACHINE PROGRESS

The National Tool and Die Journal

Editor
George J. Huebner
Assistant Editor
Paul L. Reed

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TDM PROGRESS circulation affords the only complete primary coverage of the tool rooms, die and mold shops in the production industries and the contract builders of special tools, dies, machines and precision specialties.

GEORGE J. HUEBNER, *Publisher*, 2460 Fairmount Boulevard, Cleveland, Ohio
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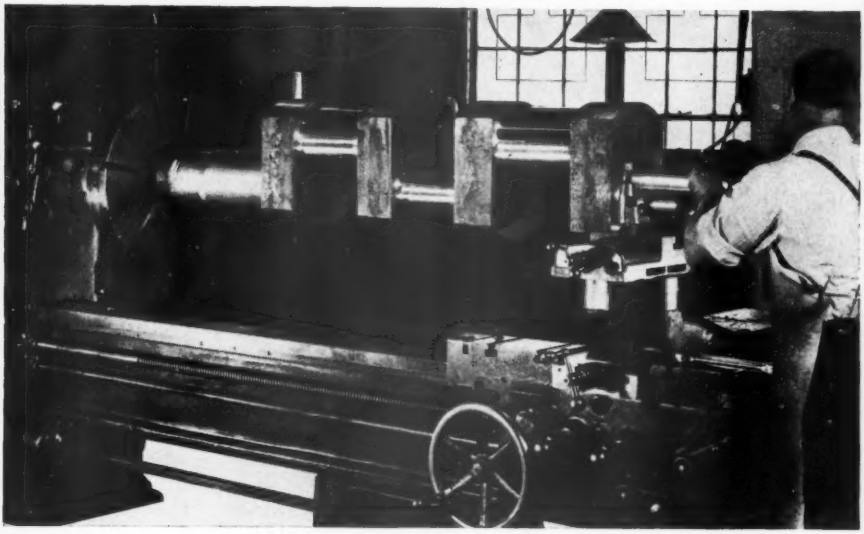
Emergency Service on EMPCO Crankshafts



A double-throw Empco Crankshaft being machined on one of our lathes —weight, 2 tons; length, 110"; pin diameter, 10"; throw, 6". Delivery 10 days after making of forging; total time, 2 weeks. Smaller crankshafts needed in emergencies, delivery one week.

A power press breakdown is a serious matter for most stamping plants. Delay in getting a press back into service is costly and can have far-reaching production results. Every day counts and we know how to "reduce" the days of machine idleness. Our facilities have been developed to meet the urgency of your needs. Our prices will show noteworthy savings over those of other supply sources. Let us prove it.

Empco Crankshaft Steel

Here is a steel that takes punishment standing up. It is alloyed of the purest base metals, melted, poured and forged under expert supervision, to achieve the highest physical properties. Scientific heat treatment brings out all the rugged qualities of this fine steel.

Forgings of EMPCO Crankshaft Steel normalize at 1650° with a Brinell hardness of 228-241 and have a tensile strength of 110,000. EMPCO Crankshafts are heated to 1550°, quenched and drawn to 900°, attaining a Brinell hardness of 269 to 300 and a tensile strength of 145,000 to 165,000 lbs. per square inch.

Overnight service on machine repair parts

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MANUFACTURERS SPECIAL MACHINERY - PARTS - MACHINE REBUILDING

THE MONARCH MACHINE TOOL CO. — SIDNEY, OHIO . . . U. S. A.

Here's What You'll See in the Monarch Booth

After registration, walk into the main auditorium. The Monarch exhibit is the first large space on the left as you enter the great arena. Here you will see 14 Monarch lathes of various sizes and types...the result of long-continued research and unending development to make them produce more and better work...in shorter time, and with less operator effort and fatigue. You will see how Monarch tool maker's lathes and engine lathes, with various attachments, have broadened the scope of profit possibilities to an extent never previously approached through the use of the lathe.

MAKE MORE MONEY

Eight of Monarch's Cleveland Show Machines, representing the latest developments in lathes, are now on display in our new showroom at Sidney, Ohio, where visitors are always welcome.

FOR THE FIRST TIME . . .

A new tool maker's lathe will be shown. It is streamlined and equipped with finger-tip controls—it is fitted with a new device for chasing threads to almost unbelievable lead accuracies.

RECENTLY INTRODUCED . . .

Two of the new 10" x 20" sensitive precision tool maker's lathes, which were recently introduced, will be shown. These lathes operate at speeds as high as 5000 R. P. M. Almost any speed is instantly available. So many people will want to see these lathes, that two of them have been placed on exhibit at the show.

FOR THE FIRST TIME . . .

The new Monarch-Keller-Kelly-shaping lathe will be shown for the first time. It will be doing the work . . . making dies, moulds and shapes impossible to conceive being done on a lathe. You won't believe it unless you see it! Literally, it will reproduce almost any shape that a cutting tool can machine . . . and, in a fraction of the time required by any other known means. Two new streamlined lathes, each providing 100 to 1 range of spindle speeds, one powered hydraulically and the other electrically, each arranged to automatically maintain any desired surface cutting speed, will be in operation. One will be a tool maker's lathe and the other an engine lathe.

ANOTHER LATHE DEVELOPMENT . . .

Another lathe representing an outstanding Monarch development will be shown machining four different classes of materials, and automatically maintaining the correct or desired surface cutting speeds on all diameters. The profit possibilities in the use of these machines, on many classes of turning work, are literally breath taking. One large manufacturer, who is using two of these machines, states that they saved their original cost in the first four months' use. Another user reduced costs 75%.

RECENTLY AVAILABLE . . .

Then, you'll want to see Monarch's Automatic Sizing lathe in operation. The controls make the lathe an automatic machine so that one operator can attend two or more machines with no more effort than is required to handle one manually controlled lathe. These machines have been on the market for only the past few months. You cannot afford to miss seeing these machines in operation.

MAGNA-MATIC

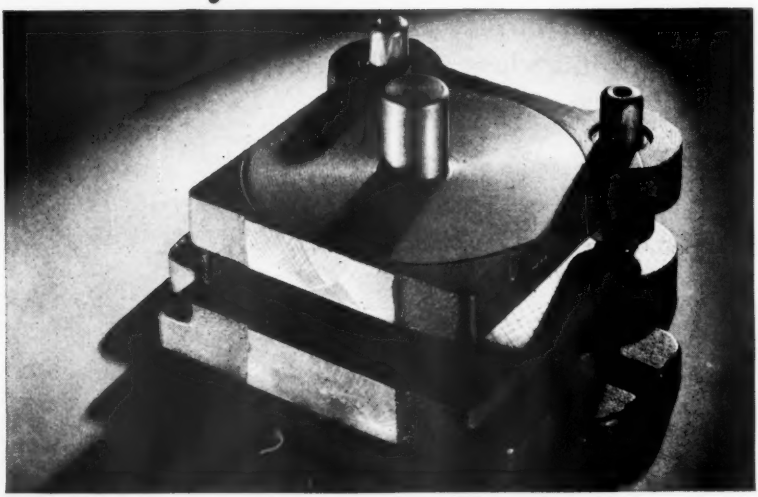
The Monarch Magna-Matic automatic lathe will be shown on a variety of work. The fact that the "set-up" time on these machines is only 5 to 10 minutes or less will be demonstrated, as well as interesting evidence of their unusual metal-removing ability.

Last but not least, we will be Flame Hardening the way surfaces of lathe beds and other parts for our machines, just as we do on a production basis in our factory at Sidney. This revolutionary process of eliminating wear and preserving accuracy, the result of Monarch research, should prove of interest to every user of machine tools.

This is necessarily a brief description of the machines you will see in the Monarch booth. Each and every one of them was developed to meet requests by customers for machines that would help them make more things for more people at lower production costs. We suggest that you allow plenty of time for the Monarch Exhibit.

WITH MONARCH'S!

Danly "SQUARE"



Precision Sets . . .

[Danly Precision Guide Posts are ground and *lapped* to plus or minus .0001" of listed dia. Precision Bushings are ground and honed to plus or minus .0001" of listed dia.]

•

"SQUARE" die sets in sizes from 3"x3" to 14"x14" are included in the new and enlarged Danly line of back post Precision Sets.

In addition to their value for mounting dies that are approximately square, these dies are especially useful for mounting round dies. The additional metal provides a firm seat for dies, in which the set is machined to permit use of bumpers, or to allow stock to drop out of the press.

A new catalog contains full information on the use of these sets and the others in the new and enlarged Danly Precision line. If you have not received one write at once for your copy. All Standard Sets are stocked in 8 Danly Branches for immediate delivery.

DIE BUYERS— Specify Danly Die Sets for your Dies

DANLY MACHINE SPECIALTIES, Inc.
2121 So. 52nd Ave., Chicago, Ill.

DIE MAKERS— Include Danly Die Sets in Your Estimates

It will be good business for you both

DANLY DIE SETS and DIE MAKERS' SUPPLIES

Their Dependable Quality Means Lower Cost Stampings

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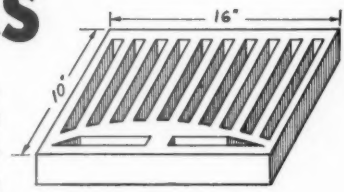
2 WEEKS' WORK IN 9 HOURS



At Standard Tool & Die Co., this Grille Die with 14 separate openings was made from 1" alloy steel on the DoAll in one day.

Think of it—over 160 linear inches of sawing and filing—a die which formerly required two weeks to make.

UNMATCHED PERFORMANCE

Contour Sawing, the new DoAll method of machining, is recognized as the fastest precision method of removing metal. Cuts out internal and external shapes from any metal up to 10" thick. Indispensable in up-to-date die making plants, where time and labor costs are always under close scrutiny.

Used in large and small plants in 30 countries by such firms as Underwood Elliott Fisher, Atwood Vacuum Machine, Taft Pierce Mfg., New Monarch Machine, Lectrolite, Federal Cartridge, Waterman Waterbury, Lincoln Engineering, General Instrument, etc.

DO-ALL Contour Machine
BAND SAWING
BAND FILING
BAND POLISHING

Let a factory-trained man bring a DoAll to your plant and show you what it does, what it saves on your own work.

TDM-9

☐ Send data on the DoAll.

☐ Send Free Hand Book.

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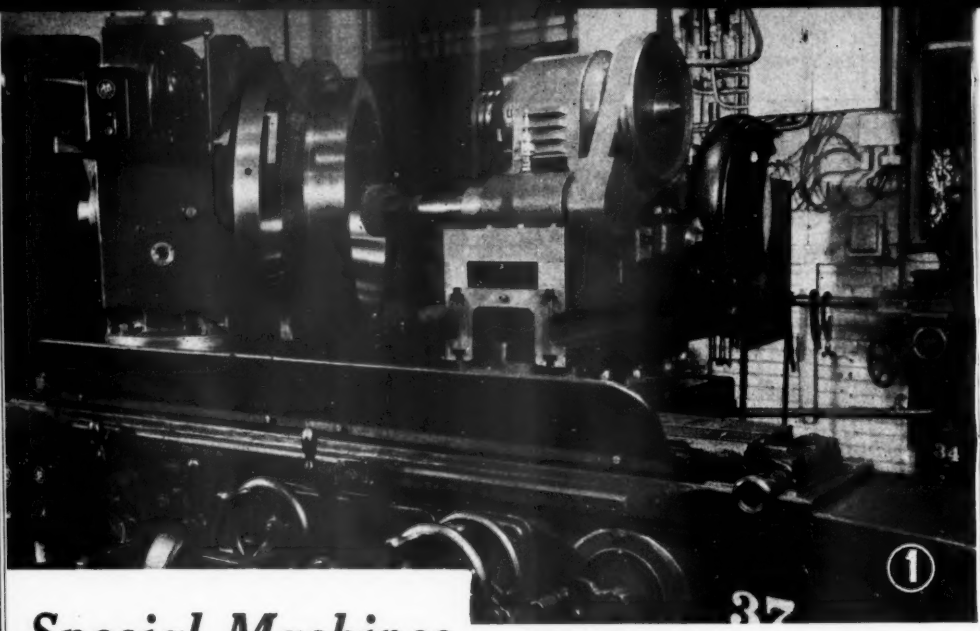


Special Machines

require a wide range of facilities for their construction

External and internal grinding spindles which are quickly adjustable to all angles in a wide variation of work sizes are mounted permanently on this 3-motor heavy duty universal grinder. The machine is set for grinding an abrupt internal angle in a 33" hardened mold ring. Our Precision Grinding facilities include the grinding of diameters of ⅛" to 37" and of lengths to more than 6 feet.

Such facilities—horizontal and vertical boring mills, milling machines, engine and toolroom lathes, planers, shapers, slotters, drill of both standard and special design, must be *uniformly modern* and *efficient* to meet the present-day demands for closer tolerances, greater speeds, quality workmanship—all at a lower cost. Late model standard machine tools, special machines, tools and accessories carefully balanced for a wide range of work permits us to follow our customers' own preferances on methods of doing their work.

permit us to follow our customers' own pref-

Versatility—Experience

We have had over 20 years experience in the *design, development* and *building* of tools, dies, gages, jigs and fixtures. This enables us to offer the best Contract Shop Service. We regularly build dies and molds—small, medium and medium-large. We have our own try-out presses. We deliver dies ready for *immediate use.* We are particularly well equipped for the *quantity production* of Precision Parts and Specialties. We maintain a well-equipped Inspection Department to protect the quality of our materials and to assure product accuracy and dependability.

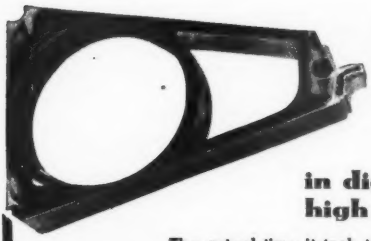
General Machine Shop Service

Our customers *come back to us for job after job* because they have found that modern equipment turns out a better quality product at a lower price.

We are always willing to demonstrate our facilities and make up estimates without obligation.

THE BUNELL MACHINE & TOOL COMPANY

1620 EAST 24th STREET *Telephone: PRospect 2681* CLEVELAND, OHIO



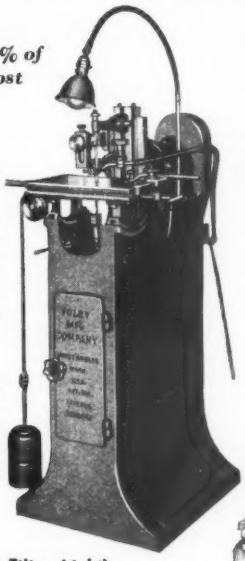
REAL SPEED

in die sawing or filing of high carbon high chrome steels

The actual time it took to make the cuts on this piece of Crescent Tool Steel (1¼ inch thick, shown at left) were as follows, using the Foley Die-Making Machine: outside cut of 20 inches, 3 hrs. 30 min.; irregular inside cut of 10¾ inches, 1 hr. 10 min.; circular cut 4¼ inches in diameter, 1 hr. 50 min. This fast and accurate metal cutting and die filing is possible because of the ease and simplicity of all adjustments, thus speeding up work and increasing capacity.

The New FOLEY DIE-MAKING MACHINE

Saves 50% to 60% of your Labor Cost



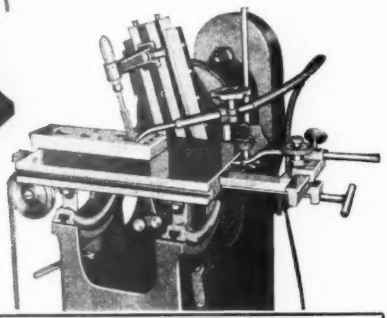
TAKES ANY SAW—Any type of saw from the finest saw to the high power high speed saw can be used without delay of changing holding fixtures. The chucks are so constructed that they will hold any kind of blades—no holes in blade necessary.

USES STANDARD OR SPECIAL FILES—From the smallest needle file to the coarsest bastard file can be used in this machine without any special holding fixtures.

Here is a machine unexcelled for fast, accurate work on high carbon-high chrome steel up to 3″ thick. Has 6⅜″ throat, saws to center of 12¾″ piece. Works in very small openings. Does angle cuts without enlarging hole.

Adjustable table tilts 20″ front, 10″ back. Ram tilts 20° right or left. Four speeds.

The Foley will quickly save its cost on sawing or filing all tool steels.



Angle Filing (right)

The Foley Die-Making Machine has a wide range of adjustment on both table and ram, which permits cutting at any combination of angles. The change from sawing to filing (or back again) is quickly and easily made.

FOLEY MANUFACTURING COMPANY 59 Main St., N.E., Minneapolis, Minn.

Please send full information on Foley Die-Making Machine **Increase your shop capacity**

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Individual .....
Address .....

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New! STANLEY Contour Grinder

For Finishing Dies, Gauges, Templets and Special Shapes

Only $69.50 Complete as Shown—Write for Details

STANLEY ELECTRIC TOOL DIVISION

THE STANLEY WORKS, 154 ELM STREET, NEW BRITAIN, CONNECTICUT

STANDARDIZED DRILL JIG BUSHINGS

ACME

TRY ACME BETTER BUSHING SERVICE

- Lead their field with consistent Quality and Service.
Scientifically measured drill clearances.
Concentric within .0003" Full Indicator Reading.
Heat treated to 62-64 Rockwell hardness.
Shipments from stock of 6700 ACME Standard items and 4200 A.S.A. Standard items.

- ACME Leader Pins and Bushings, and Dowel Pins maintain the same standards of accuracy.

- We also specialize in complete machine part manufacture requiring extremely close limits, lapped fits, etc., for pressures up to 20,000 pounds per square inch.

- Send for complete catalog or specific data sheets.

SPECIAL BUSHINGS MADE ON VERY SHORT NOTICE

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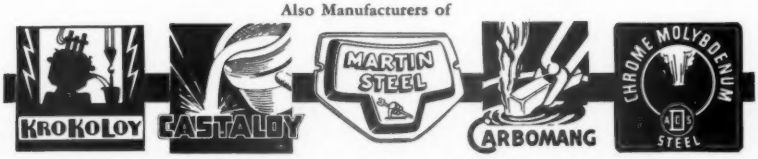
Just heat with a Torch..
...quench with Water
One easy Operation

HARDENING is easy with Flamaloy, a thoroughly practical flame-hardening steel. Most of our customers simply heat with a torch those surfaces to be hardened, and follow with a water-quench —all in one easy operation. This gives an approximate 600 to 620 Brinnell. Machining and spotting-in are done while the steel is still in the annealed state. Flamaloy castings have a wide range of applications, and are extensively used where low cost and high wear resistance are requisites. May we have an opportunity to talk with you about Flamaloy, and our other air-hardening and oil-hardening alloy and special tool steels, cast-to-shape?

DETROIT ALLOY STEEL COMPANY

Foot of Iron Street — Detroit, Michigan

Also Manufacturers of



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THE MACHINE AGE OF TOMORROW

Because it is geared to the production of only one product — because it concentrates on the building of milling machines exclusively — the K & T organization more than keeps pace with today's needs and frequently anticipates tomorrow's demands in advanced milling machine design and construction . . . The machine age of tomorrow will find in Milwaukee Milling Machines the same high standards of performance it profits by today.

IS ANTICIPATED IN THE MILWAUKEE MILLING MACHINE OF *Today!*

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K&T *Milwaukee* **MILLING MACHINES**

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Tool • Die • Machine **PROGRESS**

The National Tool and Die Journal

September, 1939 **Vol. 5, No. 6**

Get Ready! —An Editorial

THE Machine Tool Show has been "indefinitely postponed". This will be a keen disappointment to many of us but in the reason for it there is a decided note of encouragement.

Wendell E. Whipp, President of the National Machine Tool Builders' Association, has this to say: "The members of the Association feel that the greatest contribution the industry can make to the welfare of the nation at this time is to concentrate their entire efforts on the production of the greatest possible number of machine tools . . . The immediate effect of the war is a quickened demand for all of the products of industry . . . The greatest burden by far that will fall on American industry is to furnish the normal needs of nations who have been trading with the countries now at war and who can no longer be served by them. This great demand for goods of all kinds is reflected in the need for better machine tools since all manufacturing equipment is built on them."

This demand will include not only machine tools but special tooling and precision specialties of every kind. With machine tool manufacturers operating at capacity on their major products, it will be logical for them as in previous years to turn to contract builders of jigs, fixtures, gages and specialties for the making of these smaller but no less necessary tools.

These contract shops now have some of their facilities free but there are still production industries which have not completed designs nor ordered tooling for their new models. Automobile tooling is largely completed but other industries, such as refrigerator, radio and electrical manufacturers, are only now beginning to make demands.

As operations are accelerated the scarcity of skilled labor will become an increasingly difficult problem. The training of tool makers, die makers and even machinists has not gone forward in the last decade as it should have. To cope with this situation there seems to be only one alternative and that is to reduce the time which a *skilled* man must devote to each operation. Each job must be designed to include more *machine* hours and fewer *skilled worker* hours. The new machines and accessories for tool and die parts making are almost invariably designed to reduce not only the time required for a given operation but the necessity for long periods of hand finishing.

At Cleveland's two Shows, it would have been possible for us to see these new machines and accessories in actual operation. We shall make every effort to acquaint you with the new developments. If you will write us, we will see that catalogs and detailed descriptions are sent to you or you are invited to write to those companies whose advertisements appear in our publication. In any event, it would seem to be logical, according to the decision of the Machine Tool Builders, that shop owners and industry executives everywhere prepare themselves for a substantial increase in demand for their services and products.

GEORGE J. HUEBNER, Editor

Getting the Facts When You Want Them

By N. M. Olney
Mechanical Engineer

THE importance of a simple and accurate system of scheduling and recording tool orders cannot be over emphasized. Such a system that also provides a tool-up progress record is invaluable in the tool and die shop, whether it be a three man shop or one employing several hundred tool and die makers. This fact becomes very obvious when it is necessary to consult prior records for guidance in estimating the cost of new tool work, or to learn the hourly or daily progress of work in process.

Our story is confined to the average small tool shop employing approximately fifteen to twenty men. The type of tools built is for stamping, thread rolling and dialing small pressed metal details in volume production.

Prior to the installation of a simple scheduling and recording plan, the system then in use consisted briefly, of the shop foreman making an entry in his note book of the job in question, giving it a consecutive order number, and charging time to the order. In some cases this covered several tools for the same job. The daily job tickets were then sent to the payroll clerk and finally to the cost department where the various records were separated by job numbers for the month into two groups—one under the maintenance column and the other under asset accounts.

The disadvantage of such a method up to the point at which the cost department receives the daily time tickets, can readily be appreciated. For example in an order covering a group of pieces of work it is practically impossible to break down such a system to determine the cost of an individual tool. The only possible method was to check the daily time tickets, summarize all time charged and determine the cost accordingly. This, of course, is duplication, pure and simple.

In the present method, the Engineering Department makes out and issues the written order for all tool work either new or replacement. The only exception is for small jobs that run to less than five dollars, in which case the time is charged to standard job orders issued for the current month. A record is made in a tool-order book of the job order issued, insuring against loss or misplacement. The form illustrated consists of an original and a duplicate. On the reverse of the original sheet is a tabular form on which the progress of work performed is recorded. Spaces are provided for the date, employees' number or numbers, the time, rate or rates of shop cost and amount. The reverse side of the duplicate is blank. This duplicate copy is sent to the shop foreman who records or has recorded on this side the material used for the job. Material requisition blanks are also made out in duplicate as material is withdrawn from stock. The order number is entered on the requisition; the original goes to the cost department while the duplicate is retained in the shop for inventory purposes. In addition to the pertinent data given on the order, the estimated time is entered on the original only. This copy is sent to the cost department.

At the close of the day, employees make out their time tickets—depositing them in a metal box. These tickets are checked over by the shop foreman and sent to the cost department where the

(Continued on Page 38)

Die Designing and Estimating

Advanced Series

IX

By GEORGE DANNES

George Dannes is superintendent and engineer of the Permoflux Corporation of Chicago, and instructor in the advanced class studying Die Designing and Estimating at the Carl Schurz High School under the auspices of the Chicago District of the Special Tool, Die and Machine Shop Institute.

Preceding installments in this series of articles on Die Designing and Estimating have provided the reader with descriptive data and illustrations of various types of dies in general use today. Of far greater importance however, are the author's description and application of his methods for estimating the cost of a die according to tables of time values he has developed. Because dies do not lend themselves to standardized construction, accurate pre-determination of costs has always been difficult. With this method, however, many of the uncertainties have been brought under control. The series will continue with actual applications of the method to various kinds of dies. Next month a progressive die will be designed and its cost of construction estimated.

The Editor.

ESTIMATING TIME FOR THE FINAL OPERATIONS—DIE GROUPS E AND F

TO complete column E for our specimen estimate, we have only to enter opposite "stop" the time allowed for making it which according to the table of time values, Fig. 25 is from 3 to 5 hours for a shop-made automatic stop. Considering the simple construction of the die itself, the installation of the stop should be no problem and therefore 3 hours should be the time which we enter in our estimating form—Fig. 5. (June issue Page 15). This completes column E.

Column F as previously explained, records the time allowed for the final operations such as assembling, mounting of the various parts and tryout of the completed die. Time values for this column are rather difficult to standardize and good judgment and experience should be the guiding factors when determining them.

Tryout time runs from 1.0 hour for simple dies to and over 6.0 hours for the more complicated types. It is more difficult for an estimator to predict the time required for an individual operation when so many preceding operations can effect it. Experience and judgment are exceedingly important at this point. These are acquired with practice but it must be evident that columns B, C and D operations are guiding factors. If individual parts have been laid out with utmost care and all machining has been done most accurately, then fitting, assembling and mounting them should pro-

ceed without serious difficulties. Minor "misfits" almost always show up in assembling and these can be allowed for but when careless and inaccurate workmanship precedes assembly the estimator's otherwise correct time values for tryout can be easily wrecked. For emphasis then, let's frankly recognize the importance of shop management and work supervision if an estimator's figures are to be justified.

In column F we list also the values allowable for developments. Much time goes into the development of certain kinds of blanks which have to be worked out by the trial and error method. It is difficult to set up a fixed procedure for estimating the time required for this work, because shapes and forms are so numerous. A reasonably dependable method for such development will be described in a later chapter.

MACHINE OPERATIONS

ALL DIE PARTS	A	B	C	D	E	F
DIE	.6 .8	.7	.4	1.6 4.0		1.5
PUNCH	.3 .5			2.8		1.0
PUNCH PLATE	.4 .3	.7		1.2		1.0
STRIPPER	.4 .3	.7		.8 1.0		
DIE SHOE		.7		1.2		
PUNCH HOLDER		.7				
STOP					3.0	
INSPECTION			1.9			
TRYOUT						1.0
TOTAL	3.6	3.5	2.3	12.6	3.0	4.5

Data of Group A from March, of Group B and C from April issues.

4.0 hours opposite "Die" in Column D for rough machining the die opening is from the May issue. The remainder of column D is from the June issue.

ESTIMATING SHEET

Fig. 5

Some of the simpler die shapes in the everyday run of the die shop do require a certain amount of development time which should not be overlooked in the estimate. For example, with a simple L bend many an hour has been spent in trying to determine the correct length of the blank before the bending operation takes place, and then in locating the gage,

(Continued from Page 28)

Time Values for Assembling and Mounting Dies

Fig. 28

Blanking Dies

1 Mounting die and stripper on shoe—1.5 to 3.0 hours
2 Mounting punches and perforators on punch pad:
each punch .....1.0 hour
each perforator ..... .5 hour
each pilot ..... .5 hour
3 Mounting assembled punch pad on punch holder—1.0 to 3.0 hours

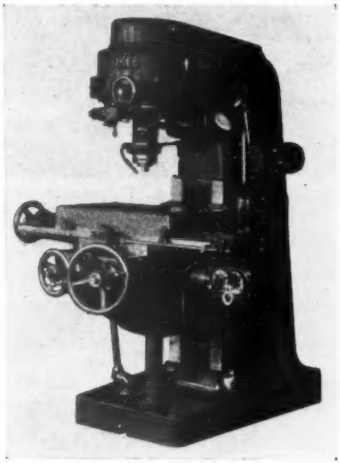
Compound Dies

1 Mounting punch pad, die and backing plate to punch holder—2.0 to 4.0 hours
2 Mounting punch and stripper to die shoe—2.0 to 3.0 hours
3 Assembling shedders or pressure pads to associated parts—1.0 to 2.0 hours

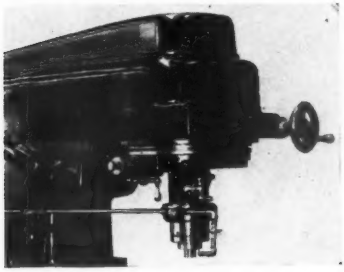
Forming and Miscellaneous Types of Dies

For solid die blocks, assembling and mounting, allow 1.0 hour each
For sectional dies, allow from .5 to 1.0 hour for each section
For sinking dies or punches into die shoe or punch holder, allow from 2.0 to 6.0 hours, depending on size and outline of the "sink."

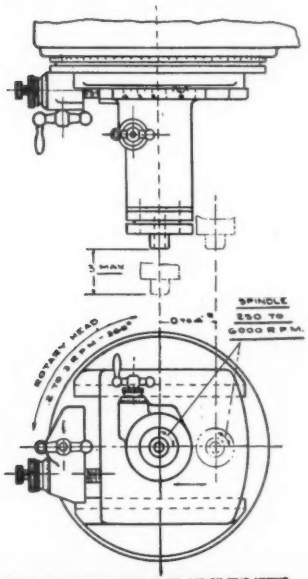
New Die Milling Machine Completes Dies At One SetUp



A UNIQUE, new machine tool, the Rotary Head Tool and Die Milling Machine that enables all layout work, milling, drilling, boring and slotting operations to be completed with one setup, has been announced by the Kearney & Trecker Corporation. Marked saving in setup and changeover time and the elimination of cumulative errors are stated to be among the outstanding advantages of the machine.



ROTARY HEAD DIAGRAM



DIAGRAMMATIC EXPLANATION OF THE ROTARY HEAD METHOD SHOWING THE ROTARY HEAD MOTION, THE METHOD OF SETTING THE SPINDLE OFF CENTER, THE VERTICAL ADJUSTMENT OF THE SPINDLE, AND THE NUMERICAL AND LINEAR LIMITS OF ALL MOVEMENTS.

The uniqueness of the Rotary Head Tool and Die Milling Machine lies in its rotary head construction. The rotary head can be compared to a rotary table held in an inverted position and having mounted on it a spindle which can be set off center radially and rotated in a planetary motion. The head may be revolved by either hand or power through a full 360° or any sector. It is driven by its individual motor and can be revolved independently of the spindle. The periphery of the rotary head has a T-slot in which trip dogs are set, permitting automatic feed throwout at any point in the rotary travel. The head is graduated in degrees, its removable handwheel dial in minutes. Index plates can be attached, permitting the spindle to be indexed in exactly the same manner as a rotary table.

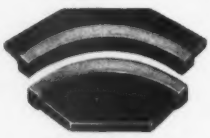
The spindle is mounted on cross slides and can be offset accurately in thousandths of an inch by means of a precision ground screw and micrometer dial. Cross slides are designed so that the spindle can be set at dead zero by inserting a 1" measuring block between two hardened pads. Thus the machine is adapted to regular vertical milling. There is 3" of vertical movement, hand or power operated. Vertical power feed has 8 feed changes from .0002 to .008 of an inch per revolution. A variable drive pulley mechanism gives an infinite number of spindle speed changes.

(Continued on Page 26)

4,000 D

FROM 35

2160-R—1160-R



260-R—160-R

230-R—130-R

126-C—125-C

2120-R—1120-R

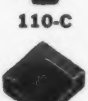
280-R—180-R

120-R

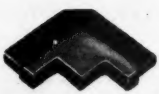
235-C—236-C

STRAIGHT

240-R—140-R



110-C

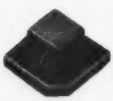


240-C

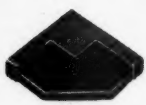
STRAIGHT

210-C

250-R—150-R



130-C



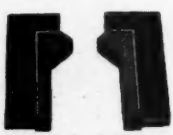
140-C

STRAIGHT

245-A—246-A

225-A—226-A

115-A—116-A



246-A—245-A

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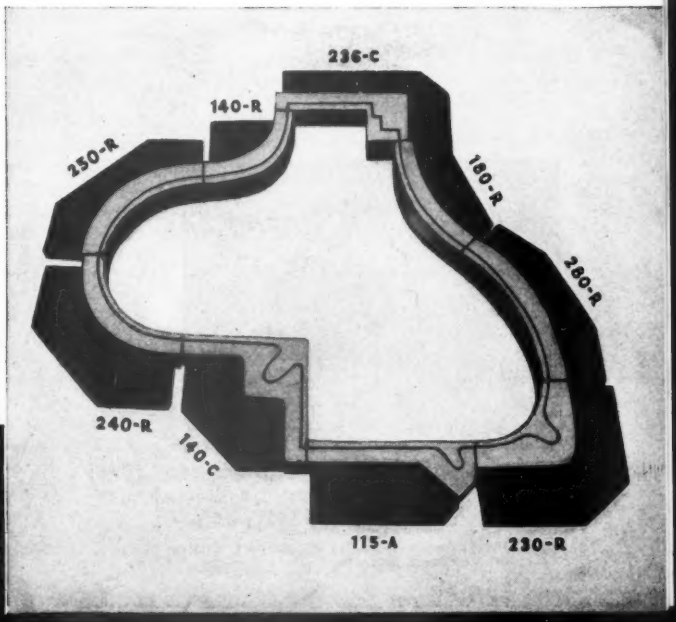


Monarch Introduces Tool Makers' Lathes, Kelley Shape-Turning Device

AN announcement of unusual interest to designers and builders of dies and molds as well as all types of tool room and die shop products is that of the Monarch Machine Tool Company regarding recently developed lathes and attachments which would have had their first showing at the Machine Tool Show.

Outstanding is the new Kelley shape-turning device which has been added to the Monarch-Keller controlled lathe. On this new unit, dies and molds and similar types of work can be turned, bored or faced to any irregular contour or any shape within the limits of the turning, boring or facing cutter used. As an illustration of what may be accomplished, Fig. 1 shows a cast iron piece 2¼" in diameter and 3½" long which was machined from the solid. The comparatively simple operation of the unit employs a thin metal templet for obtaining the desired contour with the Keller controls. A circular "record" controls the Kelley shape-turning device to obtain the desired circular shape. The master "record" requires only a few minutes to mill on the lathe itself. As many as 500 tool actuations may be imparted to the work at one revolution of the lathe spindle. Even though the diameter of the cut changes continually the contour of the work piece is perfectly maintained. This Monarch-Keller lathe equipped with the Kelley shape-turning device performing an interesting mold-making operation is illustrated in Fig. 2.

Fig. 1

Fig. 2

Fig. 3

Another new Monarch machine which was to have had its first appearance at the Show is the new 12"x30" tool maker's lathe illustrated in Fig. 3. It is powered with a new type all-electric alternating current, adjustable speed drive which employs a proven principle of speed control heretofore confined to large drives. The 100 to 1 spindle speed power unit is entirely self-contained, being mounted inside the cabinet base, and the drive is accomplished with a new type flat belt. There are two ranges of spindle speeds from 15 to 1500 R.P.M., provided by a back-geared unit on the

spindle, the range of which may be easily varied according to the requirements.

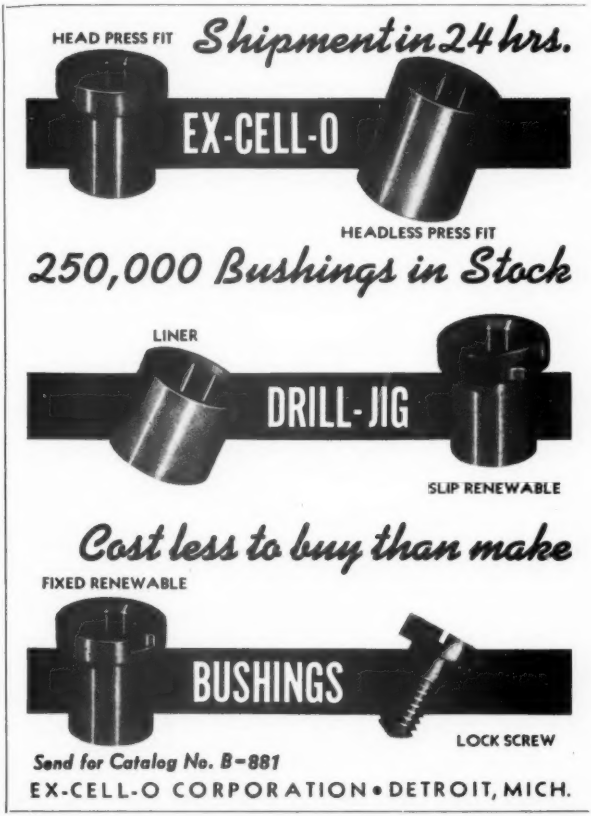
Two new lathes, one to have been shown for the first time and the other only recently introduced, are a tool maker's lathe equipped with finger-tip controls and fitted with a newly developed device for chasing threads to almost unbelievable lead accuracies. This is accomplished with the lead screw variator which can be attached to all sizes of Monarch lathes. Rough chasing is performed in the customary way, a few thousandths of an inch being left for the finishing operation. At this point a reading for accuracy is made with the work in the lathe by means of a visual gage which indicates errors to .00001", thus the lead error in each inch or other increment of the semi-finished work screw is recorded. This error is removed in the finish-chasing operation by manually adjusting the lead screw laterally by means of the variator which thus compensates for the lead errors which have been recorded in the semi-finished screw.

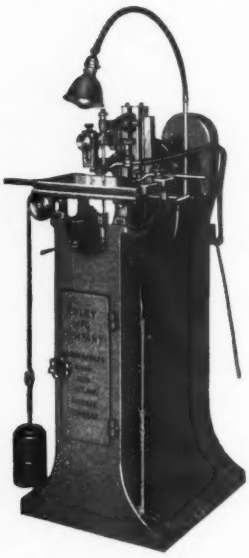
Monarch's new 10"x20" sensitive precision tool maker's lathe operates at speeds as high as 5000 R.P.M. and with almost any of the intermediate speeds being instantly available. All Monarch lathes have flame hardened beds for longer wear, accomplished with the company's patented oxy-acetylene process especially developed for the surface hardening of lathe beds. All Monarch lathes are styled in the modern manner.

These new Monarch developments and techniques are much more completely described in the company's literature which will be mailed upon request to Monarch Machine Tool Company, Sidney, Ohio. Please mention Tool·Die·Machine PROGRESS.

Correction

In the page advertisement of the Continental Machines, Inc., in our August issue, leading copy read: "Argus Engineering Company, Hartford, Conn., manufacturers of dies, jigs and fixtures, made this clock shell part in 13 hours on the DoAll." This paragraph should read: "Argus Engineering Company, Hartford, Conn., manufacturers of dies, jigs and fixtures, made *the die for* this clock shell in 13 hours on the DoAll."





Simplicity, Accuracy and Adaptability Features of New Die Making Machine

A NEW Die Making machine, which is outstanding for its simplicity, accuracy and adaptability in filing and cutting of intricate die sections, is announced by the Foley Manufacturing Company.

The Foley Die Making machine is designed to increase the speed of your work and the capacity of your shop. Its simplicity of adjustment and accurate operation make it one of the fastest reciprocating metal cutting saws, as well as universal filing machines. It handles, with equal ease, dies of the most delicate or heavy construction. This machine also offers innumerable opportunities in the shaping of plastics, as well as cutting out intricate jigs and templates.

The machine is equipped to saw all tool steels, including the high chrome-high carbon steels. Saws are available as small as $\frac{1}{16}$". The capacity of the machine is 6⅜" throat or will saw to the center of a 12¾" piece. Material up to 3" in thickness may be sawed or filed. All types of files, standard or special files, including the smallest of die makers' needle files or the coarsest of bastard files may be used in the machine. No special fixtures are required for any of these files.

Saves Half Labor Cost

The machine is designed to locate the pivotal center at the surface of the table, enabling cuts to be made at any angle without enlarging the hole. The ram—which is counter-balanced in the gear box to reduce vibration to a minimum—can be tilted up to 20 degrees right or left, and the table tilts up to 20 degrees frontward, or 10 degrees backward. Four speeds are provided by step pulleys—95, 135, 185 and 400 R.P.M. Greater accuracy can be obtained with this machine than that of the most careful die maker, while savings of 50% to 60% in labor cost alone may be expected.

All hold-downs are quickly adjustable to any work position by means of brackets and bolts in tee slots on the edge of the table. Practically no time is required in changing the machine from sawing to filing.

Air Nozzles as Hold-down

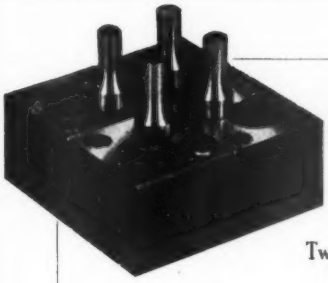
Perfect visibility is assured by a blast of air from a built-in air pump. A further feature is the design of the air nozzle as a hold-down, making only one adjustment necessary.

One of the most outstanding features of this machine is the Universal Saw Feed Guide. Forward tension on the feed is provided by an assortment of weights, while a steering block mounted on a right angle tee-section member enables the operator to steer his work at right angles to the feed, providing positive contour control on curved or irregular sections.

The Saw Guide is equipped with rollers supporting the saw in back and on both sides, preventing wear on the back of the saw.

The machine is powered by a ¼ horse power motor, which gives ample power on the heaviest work. The machine may be moved as desired, and requires only a light socket to be plugged into.

For full specifications and prices on the new Foley Die Making Machine write Foley Mfg. Co., 59 Main St., N.E., Minneapolis, Minn. Please mention TDM PROGRESS.



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One Setup Die Miller

(Continued from Page 19)

Construction features stress rigidity and sturdiness for long accuracy life and ease of operation. For example the comparatively small table, supported by a saddle longer than the table travel and an extremely rigid knee, gives a sensitivity of operation so much desired by tool and die makers.

This new machine is of unusual value in the making of multiple cavity dies. The method by which multiple cavity dies are made is one of multiple origination. This is accomplished by laying out the center lines of the cavities in a die so that they are exact distances apart. Each operation is set up and completed on the first cavity. The table is moved to the next cavity and, using the original setup, the operation is repeated. This process is continued until all the impressions are finished. In this manner we are originating multiple cavities and have the advantage that each cavity is as accurate as it would be possible to mill a single one from the solid.

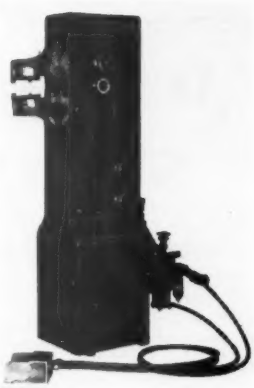
Of particular interest to those who make dies for the injection molding field is the ability of this machine to set up cores in the solid. Instead of having to drill, bore and ream a hole and then place in a core, it is only necessary to set the rotary head off center the distance necessary to give the diameter of the core desired and then rotary mill the core so that it stands up in the solid. The advantage of having solid cores is the elimination of flash. Flash is detrimental to castings because of the necessity of subsequent trimming operations and, in addition, wear occurs on set-in cores, thus necessitating frequent replacements.

The Rotary Head Tool and Die Milling Machine is exceptionally well adapted to the making of molded plastics and die casting dies. Other types of dies on which large savings can also be made are punching and blanking, shaving, extrusion and molding dies.

Complete descriptive matter on the Rotary Head Tool and Die Milling Machine including details of operations in which you are particularly interested will be promptly sent on request. Write Kearney & Trecker Corporation, Milwaukee, Wis. Please mention TDM PROGRESS.

When you order or write about products described in TDM PROGRESS please mention the publication.

Hanna Adds New High Speed Pneumatic Riveter



A complete riveting stroke, forward and return, in less than one second is a feature of a High Speed Pneumatic Riveter, the latest addition to the Hanna Riveter line.

When operated at eighty pounds air pressure this riveter exerts twenty tons on the dies and will drive up to ⅜" diameter rivets cold and ½" rivets hot. The rated pressure is uniform for variations in length of rivet and thickness of grip as much as ⅜". The power of the air cylinder is multiplied and transmitted to the driving jaws through a hardened and ground alloy steel wedge and anti-friction roller bearings. Consequently it is most economical in air consumption.

The driving jaws are of the "Alligator" or "Nut Cracker" type, shaped to avoid interference with the assemblies being riveted. They are of simple design, inexpensive, and are made of standard heat treated alloy steel bar stock. Since they may be removed very quickly any number of stakes may be kept on hand to accommodate the varying requirements of the users.

Operation is by a foot actuated valve which may be moved about for most convenient operation. The riveter is equipped with air filter, lubricator for air supply and the mechanism, which is entirely enclosed, is Alemite lubricated.

Full information on the High Speed Pneumatic Riveter will be furnished promptly by request made to Hanna Engineering Works, 1759 Elston Avenue, Chicago, Ill.

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Die Designing & Estimating

(Continued from Page 18)

nest or pilot pins, which determine the length of each leg of the bend. To further complicate the procedure there is no guarantee that the bend will come square, which calls for additional time for shimming or other adjustment until the part is as specified. The following adequate time values developed by experience for some of these everyday shapes:

Single L Bend—3.0 hours
Two L Bends—2.5 hours each
Three or more L Bends—2.0 hours each
Tubular shapes which have to be formed from a flat strip—4.0 to 7.0 hours.
Drift pierced holes—2.0 hours each

Extrusions & Embossing:

1. Simple embossings—2.0 to 4.0 hours
2. More complicated embossings—4.0 to 8.0 hours

We turn to our estimating sheet, Fig. 5.

Begin at the top of column F with 1.5 hours for mounting both the die and stripper. For mounting the punch we allow 1.0 hour, and for the punch plate or pad 1.0 hour. The stripper has been mounted with the die therefore no separate entry is made for it. Likewise we omit entries for die shoe, punch holder, stop and inspection.

Because ours is a very simple die and little difficulty should be encountered in tryout, 1.0 hour should suffice. The total for column F is 4.5 hours. Adding all column totals we arrive at our completed estimate of 29.5 hours which an experienced die builder should agree is a very fair time allotment for making our particular type of die intended for blanking out in 500,000 lots, the part shown in Fig. 1, with its specified tolerance of ± .002 inch.

Bartek Returns To Pioneer

John Bartek, formerly chief engineer of the Modern Tool Works, has been added to the engineering staff of the Pioneer Engineering & Manufacturing Company, 31 Melbourne Avenue, Detroit, Michigan. Mr. Bartek was with the Pioneer Engineering & Manufacturing Company previous to his connection with the Modern Tool Works. He will act as a specialist in threading and threading problems for Pioneer.

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Modern Collet & Machine Co., 407 Salliotte St., Ecorse, Mich.
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Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.

● **This directory of products lists for ready reference the names of manufacturers and dealers whose sales to Tool·Die·Machine PROGRESS readers have established them as dependable in every sense of the word. They merit your consideration.**

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McKenna Metals Co., 500 Lloyd Ave., Latrobe, Pa.
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Detroit Alloy Steel Co., Foot of Iron St., Detroit, Mich.
Forging and Casting Corp., The, Ferndale (Detroit), Mich.
CASTINGS—Fismaloy
Detroit Alloy Steel Co., Foot of Iron St., Detroit, Mich.
CASTINGS— Nitri-Cast-Iron
Forging & Casting Corp., The, Ferndale (Detroit), Mich.
CHUCKS—Collet
The Tomkins-Johnson Co., 630 North Mechanic St., Jackson, Mich.
CHUCKS—Magnetic
Arlavox Mfg. Co., 428 S. Green St., Chicago, Ill.
CLAMPS—Die
Danly Machine Specialties, Inc., 2121 So. 52nd Ave., Chicago, Ill.
CLAMPS—Toggle
Detroit Stamping Co., 3443 West Fort St., Detroit, Mich.
Knu-Vise Products Co., Inc., 6435 Cass Ave., Detroit, Michigan.
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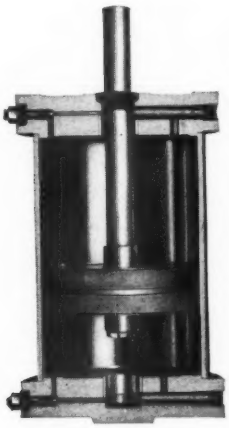

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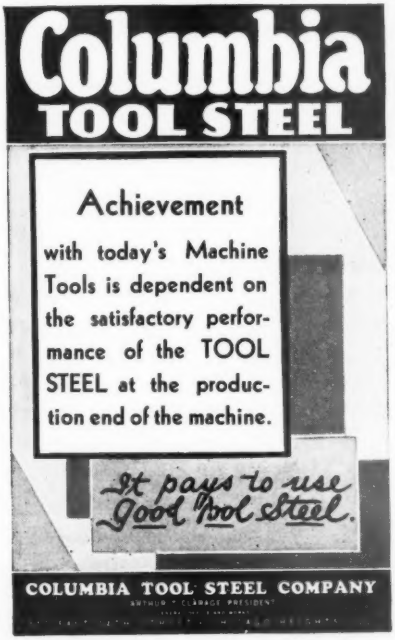
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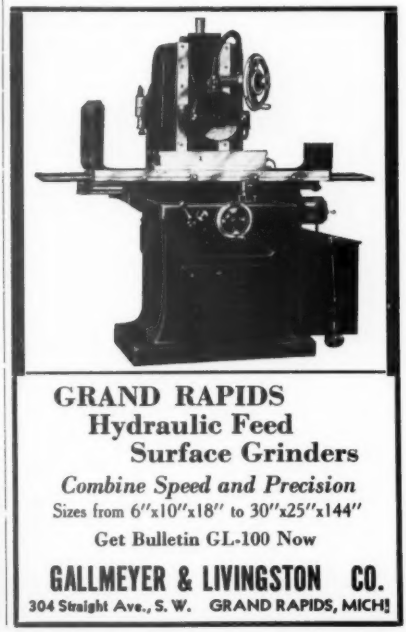

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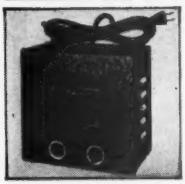

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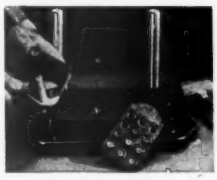

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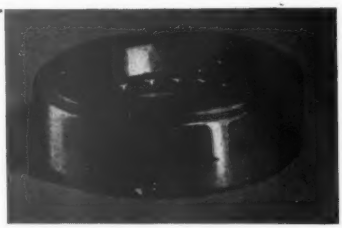

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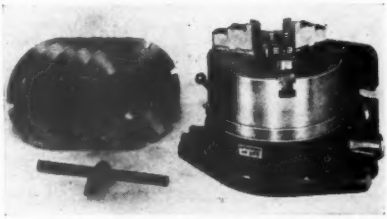

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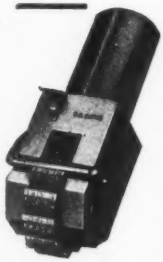

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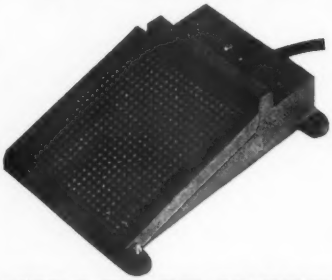

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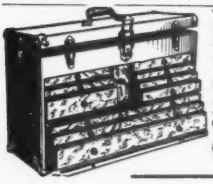
Eighteen standard shapes and sizes made up in five different cuts. Adaptable for all classes of work and for all kinds of materials. Try them on your next job.

Circular and price list on request.

THE HAMILTON TOOL COMPANY
220-248 North "B" Street Hamilton, Ohio



Help Your Men to Help You! • • •

When you encourage your machinists, tool, die and pattern makers to care for their good tools in a *Gerstner* High Grade Tool Chest, you will be repaid with increased output and with a better quality of work. . . . *Help the men choose their chest from Free Catalog.*

Gerstner Tool Chests • 56 Columbia Street Dayton, Ohio

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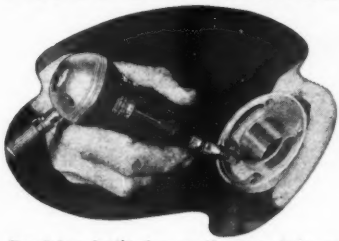
Long Continuous Service

with the

MODEL B-1 GRINDER



Precision built for continuous duty at 75,000 R.P.M. Weighs less than one pound yet actually develops ⅛ H.P. You are invited to test its power, low maintenance costs and air consumption in your plant, on your work, at no cost or obligation.

Write for descriptive bulletin and free trial offer.

ONSRUD MACHINE WORKS, Inc.
3914 Palmer St. Chicago, Ill.

GROBET
ROTARY FILES

Ground from the Solid

Ask for Catalog YG illustrating hundreds of Rotary Files—hand cut—mill cut. Ground from the solid. Ask also for our Catalog YF illustrating more than 5000 different shapes, sizes and cuts of Grobet Precision Files, also files for all types of filing machines.

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CLAMPING TRUNK RACK TO DRILL JIG

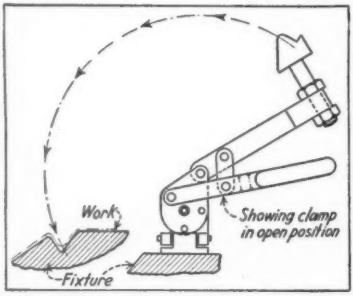
KNU-SINE
TOGGLE CLAMPS

These toggle action clamps provide the fastest and yet most inexpensive method of locating parts in dies, jigs, and fixtures. Automatically lock into position, instantaneous release, hundreds of possible applications.

•

Ces appareils bloquent et desserrent instanement. Ils trouvent leur emploi dans de nombreuses opérations de soudage, de perçage, d'alésage, d'assemblage et permettent de supprimer ou de simplifier les montages spéciaux utilisés pour ces opérations. Indispensables pour tous travaux de série exigeant un assujettissement rapide et énergique des pièces.

Ask for catalog and new reduced prices.



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Among these shops will be found modern facilities for building every kind of Special Tool, Die and Machine. Some are equipped for small and medium size work, others for large. Some do Designing and Engineering, Development and Experimental Work and build Models; others are equipped for production of Precision Specialties of every description. Still others operate Machine Production plants and manufacture Parts, Stampings and Complete Assemblies. All will appreciate the opportunity to submit estimates.

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BUILDERS of DIES
Facilities for the Largest
MANUFACTURERS of STAMPINGS

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Modern equipped shop for building of
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Equipment includes:
3" and 5" spindle Horizontal Boring Mills
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SHEET METAL DIES, TOOLS, SPECIAL MACHINERY, DIE CASTING DIES
RUBBER MOULDS
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Modern Facilities
150-Man Shop

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JIGS, FIXTURES, DIES
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PLANERS
42" by 14 ft. long
24" by 6 ft. long
Let us figure

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EXTERNAL CYLINDRICAL
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"Let us be your tool room."
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The Hamilton Portable Elevating Table

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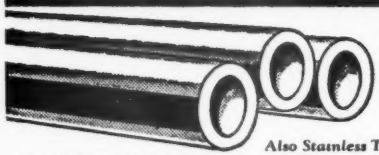
OIL HARDENING TOOL STEEL TUBING



Substantially reduces labor costs by eliminating the expensive procedure of drilling from the solid.
BISCO TOOL STEEL TUBING is a fine grade tool steel in tubular form available in sizes up to 14" diameter and 2" wall thickness; other sizes to your specification.

THE BISSETT STEEL COMPANY
947 E 67th St., Cleveland, Ohio

Also Stainless Tubes, Mechanical Tubes, Aircraft Tubes, Pressure Tubes
C. O. Watkins, 11955 Princeton Ave., Chicago, Ill. Victor Brook, 433 Rockingham St., Rochester, N. Y.

Getting the Facts

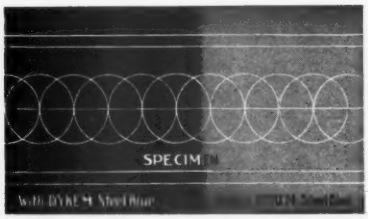
(Continued from Page 16)

time is entered on the reverse side of the original order. The daily job tickets are costed for payroll purposes and segregated according to account numbers. The purpose of entering the time on the original order blank is obvious—it makes a permanent and independent record available to the Engineering Office for guidance in estimating future jobs and also permits a careful watch on the time and cost factor as the job progresses.

At the completion of the job, the duplicate and original blanks are fastened together and filed in the Engineering Office for future reference.

It might be well to point out that the estimated time entered on the original blank is known to the foreman since he is generally consulted and is in constant touch with the Engineering Office, keeping posted on all factors of jobs in the shop. The purpose of not entering the time on the duplicate is that this copy is generally on the foreman's desk and it is not always desirable to have the time set for the job known to the shop.

In addition to the above routine, where tool production schedules are to be met, it is desirable to use a chart of suitable form, which gives at a glance the status of the tool-up schedule.



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STOPS LOSSES
making dies & templates

Simply brush on; ready for the layout in a few minutes. The dark blue background makes the layout lines show up in a sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

THE DYKEM COMPANY
2201 N. 11th STREET ST. LOUIS, MO.

No Mushrooming ▶
No Chipping ▶
Oversize Shanks ▶
Exclusive Knurled Back ▶
Exclusive Thumb Grip ▶
Broach-Rounded ▶ Corners

and a complete line of Marking Devices

Write for Price and data Bulletin No. 113-12.

NEW METHOD STEEL STAMPS, Inc.
149 Joseph Campau, Detroit

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Jigs, Fixtures and Gages of Special Design for One Production Manufacturer..

"*Imitation is the sincerest flattery*" they say but we prefer the satisfaction which a customer expresses when he buys from us again and again. Then we know that our workmanship, materials and service have been "tops".

The Designing and Building of any kind of Jig, Fixture or Gage—from the inexpensive welded types to those of utmost precision—is a specialty with us and we have regular customers as far distant as 1000 miles from our plant.

20 years of widely varied experience are at your disposal.

Please send us your prints for estimates.

THE SOMMER & ADAMS COMPANY

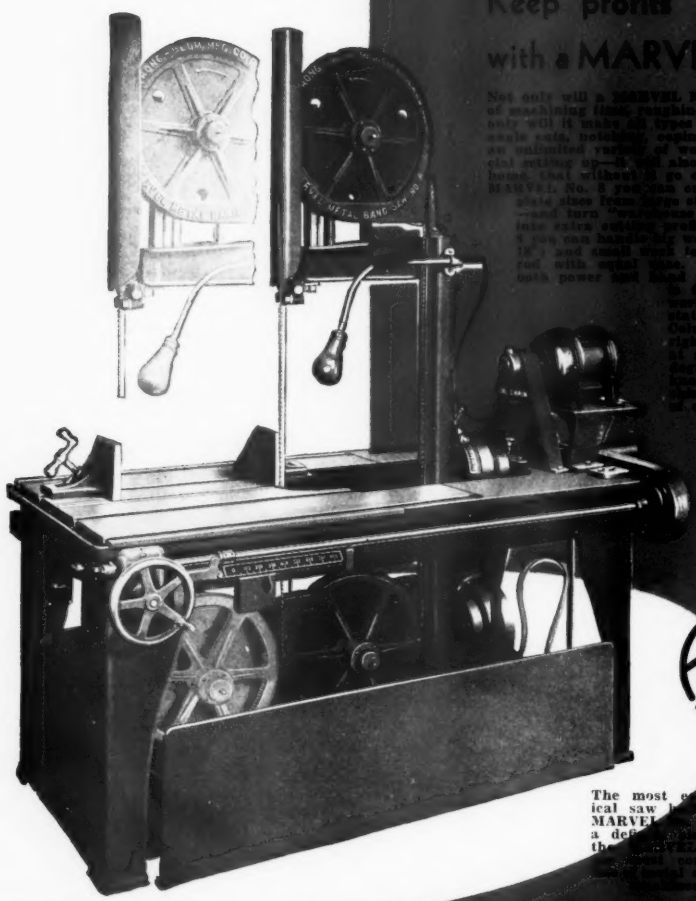
Builders also of S & A Automatic Machines for Continuous Milling, Drilling and Polishing, adaptable to the needs of many industries.

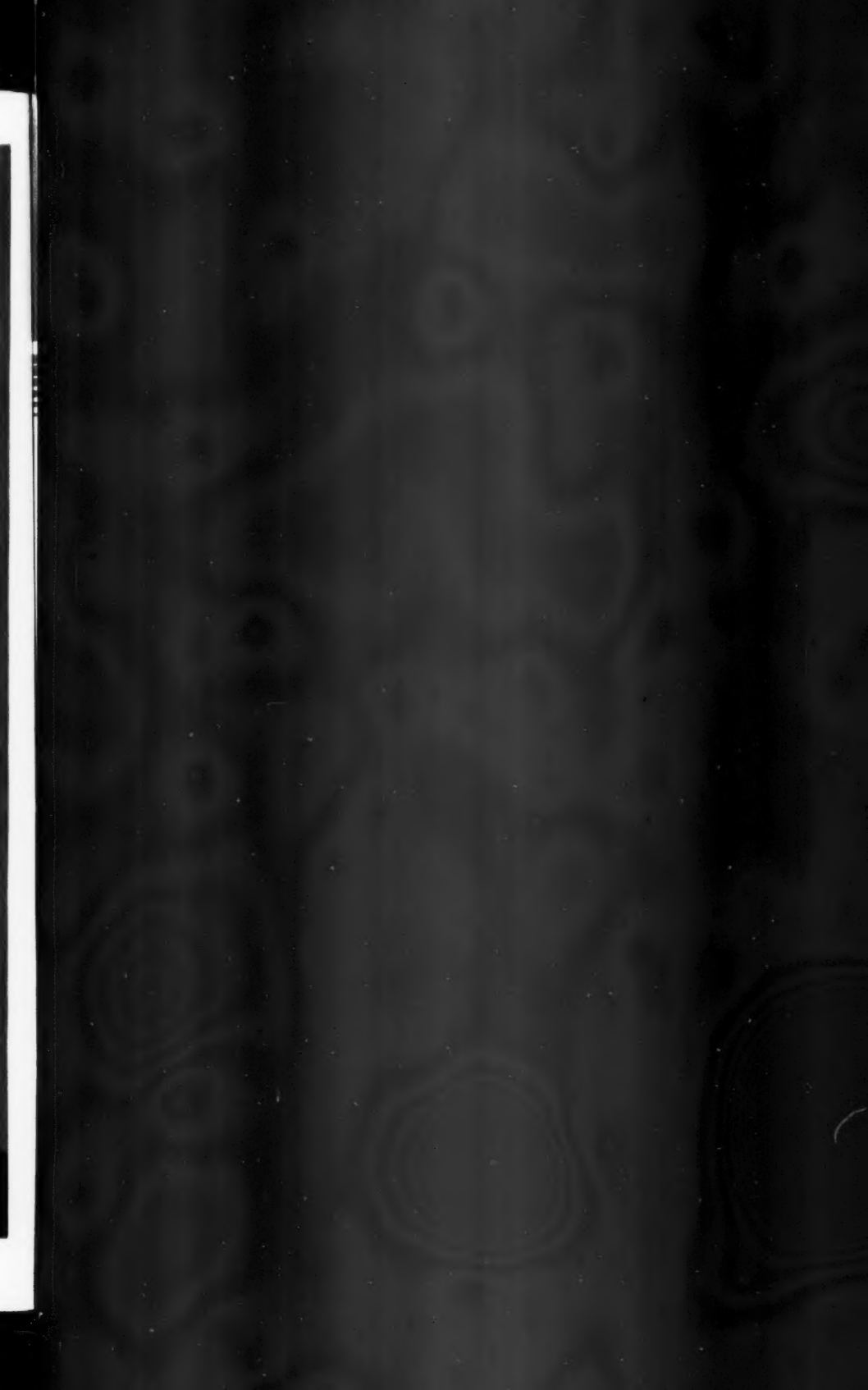
18511 Euclid Avenue Cleveland, Ohio

MARVEL SAWS

Keep profits at home with a MARVEL No. 8

Not only will a MARVEL No. 8 save hours of machining time, roughing-out work—not only will it make all types of straight and angle cuts, notching, coping, mitering and an unlimited variety of work without special cutting up—it will also keep profits at home, that without it go outside. With a MARVEL No. 8 you can cut your own die plate sizes from large stock billets, etc., —and turn "purchase cutting extras" into extra cutting profits. With a No. 8 you can handle big work (up to 18" x 18") and small work to the finest drill size with equal ease. Equipped with both power feed and hand feed, the blade is fed through the work (work remains stationary on table). Column tilts either right or left to cut at any angle to 45 degrees. Automatic knock-off stops machine at any depth cut desired.



The most economical saw for the MARVEL line fills a definite place in the MARVEL line. A complete metal sawing machine.

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